to view the sample through the lens 19. That is, the point 26 on the sample plane illustrated, e.g., in Fig. 3 may be located above or below the lens 19, to the left or to the right of the lens 19, or in a combination thereof. For example, in order to view a sample below the microscope illustrated in Fig. 3, the microscope would be inverted from the position shown in Fig. 3 to direct the lens 19 toward the sample.--.

Page 12 line 18 change "to" to --of--.

Page 17 line 15 after "wafer" insert --14--; same line after "cavity" insert --21--;

line 16 after "plate" insert --16--; same line delete "used" and insert --fused--; and

line 19 after "face" insert --22--.

IN THE CLAIMS

Please rewrite claims 44-72 as follows.

44. (Amended) An optical beam steering apparatus comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam [in a direction substantially normal to the upper surface of the substrate body].

45. (Not amended) The optical apparatus according to claim 44 wherein the beam steering assembly is placed at a predetermined orientation within the upper cavity for controllably altering the optical path of an impinging beam in at least one direction that is emanating from or propagating towards the primary optical path.

46. (Not amended) The optical apparatus according to claim 44 wherein the primary optical path is a waveguide.

47. (Not amended) The optical apparatus according to claim 44 wherein the primary optical path is a groove for accommodating the passage of the light beam.

48. (Not amended) The optical apparatus according to claim 47 wherein the groove is a V-groove.

49. (Not amended) The optical apparatus according to claim 48 further comprising a primary optical element for accommodating the light beam wherein the primary optical element is provided within the V-groove.

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50. (Amended) The optical apparatus according to claim 49 wherein the primary optical element is selected from the group consisting of optical waveguides, [refractive optical elements, reflective optical elements, phase optical elements,] light detectors, beam splitters, and lasers[, light emitting diodes, incandescent light sources, fluorescent light sources, natural light sources, and plasma light sources].

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51. (Not amended) The optical apparatus according to claim 44 wherein the substrate body is formed of a crystal having a differential etch rate between different crystallographic planes.

52. (Not amended) The optical apparatus according to claim 44 wherein at least one cavity is anisotropically etched into the substrate body.

53. (Not amended) The optical apparatus according to claim 44 further comprising a cover plate for covering at least one cavity and an adjacent surface of the substrate body.

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54. (Amended) The optical apparatus according to claim 53 wherein the cover plate is formed from fused silica [a material with at least one characteristic selected from the

group consisting of optically opaque, transparent, translucent, electrically conductive, and electrically insulative].

55. (Not amended) The optical apparatus according to claim 44 further comprising:

a hinge for flexibly connecting the beam steering assembly with an upper edge of the upper cavity that is not coincident with the primary optical path;

wherein the beam steering assembly includes at least one reflective surface such that the beam steering assembly is disposed within the upper cavity so that an impinging beam of light emanating from the primary optical path is controllably deflected in the same general direction the upper cavity is facing and wherein a beam of light entering from the same general direction the upper cavity is facing is controllably deflected towards said primary optical path.

56. (Twice amended) A hybrid optical steering system comprising:

a first substrate body defined by an upper surface and a lower surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity;

a second substrate body defined by an upper surface and a lower surface, said second substrate body having a lower cavity formed on the its [lower] upper surface, said lower cavity having a predetermined alignment with respect to the upper cavity;

a suspended bridge spanning the primary optical path at a juncture between the primary optical path and the upper cavity;

a beam steering assembly having a steerable element positioned substantially adjacent the upper cavity for controllably directing the light beam through at least a portion of the first

substrate body; and

a hinge for flexibly anchoring the beam steering assembly to the suspended bridge wherein the beam steering assembly has at least one reflective surface and is rotated towards the upper cavity so that an impinging beam of light emanating from the primary optical path is controllably deflected in a direction generally from the upper cavity to the lower cavity and an impinging beam of light entering from the lower cavity is controllably deflected in a direction generally from the lower cavity to the upper cavity towards the primary optical path.

57. (Twice amended) The optical apparatus according to claim 56 further comprising:

a secondary optical element for accommodating a beam of light disposed within the lower cavity of the second substrate body; and

means for aligning the secondary optical element within the lower cavity so that

(i) the secondary optical element is substantially centered in the lower cavity and

(ii) the optical axis of the secondary optical element is aligned at a predetermined angle with respect to the lower surface of the first substrate body.

58. (Not amended) The optical apparatus according to claim 57 wherein the secondary optical element is selected from the group consisting of optical fibers, refractive optical elements, reflective optical elements, phase optical elements, light detectors, beam splitters, lasers, light emitting diodes, incandescent light sources, fluorescent light sources, natural light sources, and plasma light sources.

59. (Twice amended) a micro-machined steerable optical device comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body, and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity;

a beam steering assembly having a steerable element positioned substantially adjacent to the upper cavity for controllably directing the light beam through at least a portion of the substrate body; and

a frame and gimbaled micromirror nested in a set of gimbaled hinges that provides an axis of rotation of the gimbaled micromirror with respect to the frame and wherein the frame holds the set of the gimbaled hinges and is connected to the upper surface of the substrate body so that the beam steering assembly may deflect a light beam in a direction towards a [one] surface of the substrate.

60. (Not amended) The steerable optical device according to claim 59 further comprising:

a plurality of independently addressable electrodes disposed about the gimbaled micromirror for positioning the micromirror in direct electrical communication with a plurality of electrical lines; and

electronic control means in communication with the electrical lines for electrically driving the gimbaled micromirror to a predetermined angular orientation with respect to the frame.

61. (Not amended) The steerable optical device according to claim 59 wherein the gimbaled micromirror is defined by an electrically conductive and optically reflective surface and further includes a conductive film.

62. (Not amended) The steerable optical device according to claim 61 further

including an insulating film covering at least a portion of the gimbaled micromirror.

63. (Twice amended) A micro-machined steerable optical device comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in predetermined orientation with the upper cavity;

a beam steering assembly having a steerable element positioned substantially adjacent to the upper cavity for controllably directing the light beam through at least a portion of the substrate body; and

a frame and a micromirror nested in a set of hinges that provides an axis of rotation of the micromirror with respect to the frame and wherein the frame holds the set of hinges and is connected to the upper surface of the substrate body so that the beam steering assembly may deflect a light beam in a direction towards [one] a surface of the substrate.

64. (Not amended) The steerable optical device according to claim 63 further comprising:

a plurality of independently addressable electrodes disposed about the micromirror for positioning the micromirror in direct electrical communication with a plurality of electrical lines; and

electronic control means in communication with the electrical lines for electrically driving the micromirror to a predetermined angular orientation with respect to the frame.

65. (Not amended) The steerable optical device according to claim 63 wherein the micromirror is defined by an external surface and is formed with a conductive film adjacent to its external surface and across the at last one set of hinges so that the micromirror is in electrical communication with the electronic control means.

66. (Twice amended) A micro-machined steerable optical device comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body, and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity;

a beam steering assembly having a steerable element positioned substantially adjacent to the upper cavity for controllably directing the light beam through at least a portion of the substrate body; and

a frame and a hybrid micromirror nested in at least one set of gimbaled hinges including a relatively outermost set of hinges that provides additional axes of rotation of the hybrid micromirror with respect to the frame and wherein the frame holds an outermost set of the hinges and is connected to the upper surface of the substrate body so that the beam steering assembly may deflect a light bean in a direction towards [one] a surface of the substrate.

67. (Not amended) The steerable optical device according to claim 66 further comprising:

a plurality of independently addressable electrodes disposed about the hybrid micromirror for positioning the micromirror in direct electrical communication with a plurality of electrical lines; and

electronic control means in communication with the electrical lines for electrically driving the hybrid micromirror to a predetermined angular orientation with respect to the frame.

68. (Not amended) The steerable optical device according to claim 66 wherein the hybrid micromirror is defined by an electrically conductive and optically reflective surface

and further includes a conductive film.

69. (Not amended) The steerable optical device according to claim 68 further including an insulating film covering at least a portion of the hybrid micromirror.

70. (Not amended) An optical head assembly comprising:

a single substrate body defined by an upper surface and formed with at least one cavity including an upper cavity formed on the upper surface of the substrate body and a primary optical path for accommodating the passage of a light beam aligned in a predetermined orientation with the upper cavity; and

71. (Not amended) The optical apparatus according to claim 70 wherein the beam steering assembly is rigidly affixed within the upper cavity by chemical bonding with a chemical bonding agent.

72. (Not amended) The optical apparatus according to claim 70 wherein the beam steering assembly is rigidly affixed within the upper cavity by thermal bonding with a thermal bonding agent.

REMARKS

I.

Favorable reconsideration of this application, as presently amended, is respectfully requested.

Claims 44-72 are presently active in this application. Claims 1-43 have been canceled.

II.

On page 2 of the office action, the examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. The specification has been